

NATIONAL SECURITY

Lawrence Livermore National Laboratory was established in 1952 to help ensure national security through the design, development, and stewardship of nuclear weapons. National security continues to be the Laboratory's defining responsibility.

Threats to national security and global interests keep the United States actively engaged in world events at the beginning of the 21st century. The U.S. is committed to halting the spread of nuclear as well as chemical and biological weapons worldwide while maintaining sufficient nuclear forces to deter any adversary. Lawrence Livermore National Laboratory contributes to these important endeavors.

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Providing for National Security in a Changing World

A Part of the NNSA

Livermore is one of the three national security laboratories that are part of the National Nuclear Security Administration (NNSA), which began

operation within DOE in March 2000. With General John A. Gordon serving as its first administrator, NNSA brings together DOE's national security functions, a clear mission, and unique responsibilities.

Safe and Reliable Nuclear Weapons

Livermore plays a prominent role in the Stockpile Stewardship Program for maintaining the safety and reliability of the nation's nuclear weapons in the absence of nuclear testing. Working with the other NNSA laboratories, we are

attending to the immediate needs of the stockpile through assessments and actions based on a combination of laboratory experiments and computer simulations of nuclear weapon performance. We are also acquiring more powerful experimental and computational tools to address the more challenging issues that will arise as the nation's nuclear weapons stockpile continues to age.

Proliferation Prevention and Arms Control

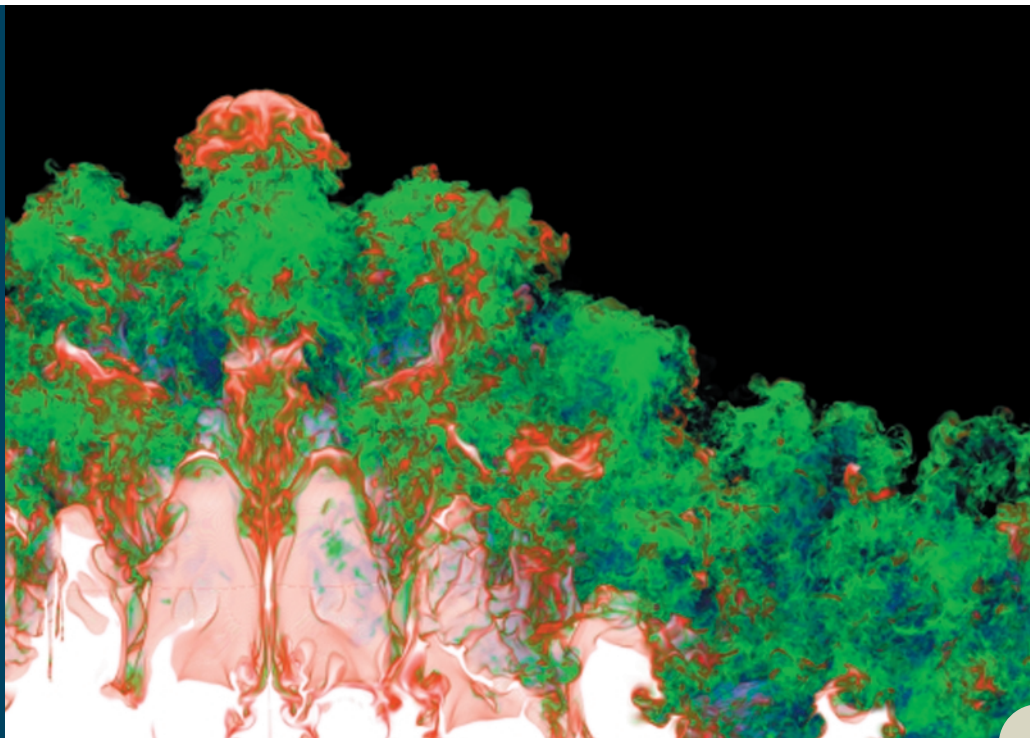
The Laboratory is addressing the dangers posed by the proliferation of



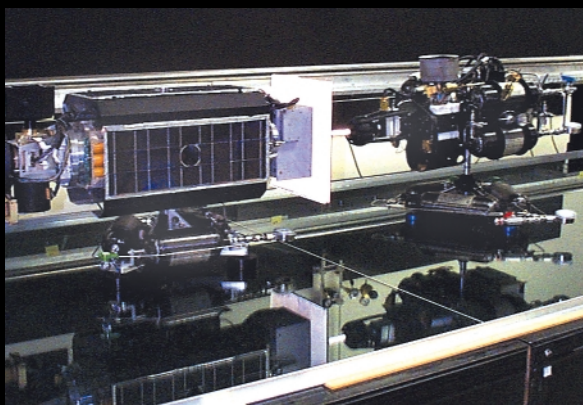
Congressional interest in stockpile stewardship remains high. The establishment of the NNSA, workforce quality and diversity, and the rebaselining of the National Ignition Facility (NIF) were priority issues for Representative Ellen Tauscher (10th District, California), a frequent visitor to the Laboratory. She and Representative Mac Thornberry (center, 13th District, Texas), both members of the House Armed Services Committee, met with Director Bruce Tarter and toured NIF (right photo) in December 1999.



High-resolution, three-dimensional (3D) scientific simulations using Accelerated Strategic Computing Initiative (ASCI) supercomputers are central to stockpile stewardship. An 8-billion-zone simulation recently revealed fine-scale physics of turbulence never seen before. The calculation generated more than 2 terabytes (2 million megabytes) of graphics data in more than 300,000 files.



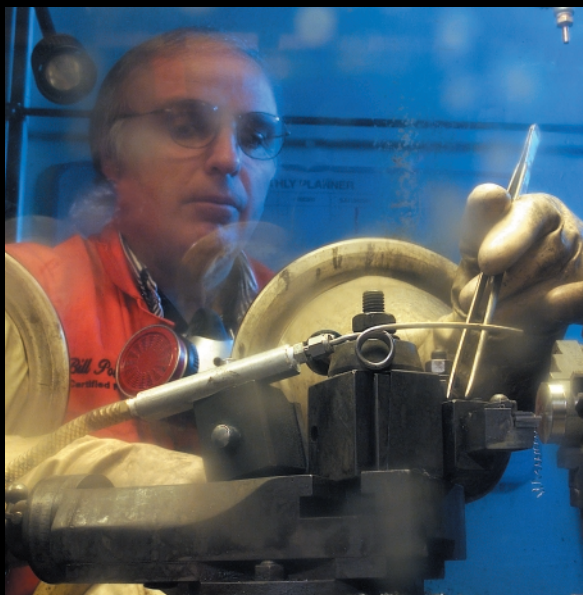
nuclear as well as chemical and biological weapons through a wide spectrum of analysis and technology development activities. In addition, Livermore provides the government with technical information and assistance to support the development of national policy on nuclear weapons, nonproliferation, and arms control.



An engineering test vehicle (ETV) at Livermore demonstrates critical capabilities that future microsatellites will need to perform complex autonomous operations in the proximity of other space objects. With its novel object-tracking system and miniaturized propellant system, the ETV has repeatedly succeeded in docking with another object in dynamic experiments on an air table that simulates zero-gravity conditions.

Technology for New Security Requirements

Building on the scientific and technical capabilities needed for the Laboratory's stockpile stewardship and nonproliferation missions, Livermore develops advanced defense technologies for the Department of Defense (DoD) and other sponsors to increase the effectiveness of U.S. military forces and meet emerging national security needs.



A technician trained in handling fissile material inspects a plutonium part for an experiment at Livermore's plutonium facility. The Laboratory supports the Stockpile Stewardship Program through basic research on the properties of plutonium and surveillance of pits from Livermore-designed weapons. In leading the national plutonium immobilization program, we have developed and demonstrated hardware alternatives for plutonium storage.